

WHAT IS CLAIMED IS

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3 1. An injection mold for manufacturing two-component
4 elongated members including in combination:

5 first and second mold cavity members mounted for relative
6 movement toward and away from one another in each cycle of
7 operation to close and open the mold, respectively; and

8 a central frame member through which at least a portion
9 of each of the first and second mold cavity members extend to
10 engage one another when the mold is closed, the central frame
11 member carrying a rotatable mold plate located between a portion of
12 each of the first and second mold cavity members for engagement
13 thereby when the mold is closed.

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15 2. The injection mold according to Claim 1 wherein the
16 rotatable mold plate rotates about an axis perpendicular to the
17 relative direction of movement of the first and second mold cavity
18 members toward and away from one another.

LAW OFFICE OF
LAVALLE D. PTAK
2835 N. 11TH STREET, SUITE 200
CAVE CREEK, ARIZONA 85331
(480) 419-9019

1 3. The injection mold according to Claim 2 wherein the
2 central frame member is an open rectangular frame with a top, a
3 bottom, and first and second sides interconnecting the top and the
4 bottom, wherein the rotatable mold member is rotatably mounted on
5 a central pivot located between the top and bottom of the frame
6 member and further wherein the rotatable mold plate has transverse
7 dimensions across it between the first and second sides of the
8 frame member which are substantially less than the distance across
9 the opening between the first and second sides of the frame member.

10 ~~4. The injection mold according to Claim 3 wherein portions~~
11 ~~of the first and second mold cavity members extend past the~~
12 ~~rotatable mold plate to directly engage one another through the~~
13 ~~opening in the frame member on each side of the rotatable mold~~
14 ~~plate when the mold is closed.~~

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16 ~~4~~³ 3. The injection mold according to Claim ~~4~~³ wherein the
17 rotatable mold plate has first and second faces and is rotated 180°
18 in the central frame member each time the first and second mold
19 cavity members are moved away from one another a predetermined
20 maximum distance, whereupon each successive closure of the mold by
21 movement of the first and second cavity members toward one another
22 causes alternate ones of the first and second faces of the
23 rotatable mold plate to engage corresponding portions of the first
24 and second mold cavity members.

5~~8~~. The injection mold according to Claim ~~5~~⁴ wherein the elongated members are toothbrushes with a head portion and a handle portion, and wherein a first component of the two-component toothbrush is used to form the head in a cavity in the first mold cavity member and a corresponding cavity in the rotatable mold plate, and to form a first component of the handle in mating cavities between first portions of the first and second mold cavity members extending through the central frame member, whereupon opening of the mold by relative movement of the first and second mold cavity members away from one another causes the central frame member also to be located one-half the distance between the first and second mold cavity members while rotating the rotatable mold plate with the toothbrush head attached thereto 180° prior to the next cycle of closure of the mold.

6~~7~~. The injection mold according to Claim ~~6~~⁵ wherein the second component of the two-component elongated toothbrush is formed between second portions of the first and second mold cavity and the first component of the handle of the toothbrush carried by the rotatable mold plate in the central frame member.

7~~8~~. The injection mold according to Claim ~~7~~⁶ further including mechanism for ejecting finished two-component toothbrushes from the rotatable mold plate when the first and second mold cavity members are moved away from one another.

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9. The injection mold according to Claim 1 wherein the elongated members are toothbrushes with a head portion and a handle portion, and wherein a first component of the two-component toothbrush is used to form the head in a cavity in the first mold cavity member and a corresponding cavity in the rotatable mold plate, and to form a first component of the handle in mating cavities between first portions of the first and second mold cavity members extending through the central frame member, whereupon opening of the mold by relative movement of the first and second mold cavity members away from one another causes the central frame member also to be located one-half the distance between the first and second mold cavity members while rotating the rotatable mold plate with the toothbrush head attached thereto 180° prior to the next cycle of closure of the mold.

9¹⁰. The injection mold according to Claim 8 wherein the second component of the two-component elongated toothbrush is formed between second portions of the first and second mold cavity and the first component of the handle of the toothbrush carried by the rotatable mold plate in the central frame member.

10¹¹. The injection mold according to Claim 9 further including mechanism for ejecting finished two-component toothbrushes from the rotatable mold plate when the first and second mold cavity members are moved away from one another.

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12. The injection mold according to Claim 1 wherein the central frame member is an open rectangular frame with a top, a bottom, and first and second sides interconnecting the top and the bottom, wherein the rotatable mold member is rotatably mounted on a central pivot located between the top and bottom of the frame member and further wherein the rotatable mold plate has transverse dimensions across it between the first and second sides of the frame member which are substantially less than the distance across the opening between the first and second sides of the frame member.

~~13. The injection mold according to Claim 12 wherein portions of the first and second mold cavity members extend past the rotatable mold plate to directly engage one another through the opening in the frame member on each side of the rotatable mold plate when the mold is closed.~~

14. The injection mold according to Claim 1 wherein the rotatable mold plate has first and second faces and is rotated 180° in the central frame member each time the first and second mold cavity members are moved away from one another a predetermined maximum distance, whereupon each successive closure of the mold by movement of the first and second cavity members toward one another causes alternate ones of the first and second faces of the rotatable mold plate to engage corresponding portions of the first and second mold cavity members.

13 ✓ 15. The injection mold according to Claim 14 wherein portions
of the first and second mold cavity members extend past the
rotatable mold plate to directly engage one another through the
opening in the frame member on each side of the rotatable mold
plate when the mold is closed.

16. A method for manufacturing two-component injection molded
elongated members including the steps of:

mounting first and second mold cavity members in a
molding machine for relative movement toward and away from one
another in each cycle of operation to close and open a mold,
respectively;

locating an open frame in the closed position of the mold
which surrounds and overlies at least a portion of each of the
first and second mold cavity members;

placing a rotatable mold plate in the frame for rotation
about an axis perpendicular to the direction of relative movement
of the first and second mold cavity members toward and away from
one another; and

rotating the rotatable mold plate 180° each time the
first and second mold cavity members are moved away from one
another to open the mold to thereupon rotate pre-forms and finished
parts made in the mold 180° for each cycle of operation.

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